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B8P
E2A
Selected US specifications from IPC sub-class
B65D

(54) Collapsible box pallet

(57) Collapsible enclosure of rectangular shape, adapted to be carried by a pallet (10) comprises two side walls (12,13) and two end walls (14,15) each wall comprising a frame (32-34, 35-37) and a rigid panel (351,38) secured at the in-situ inside surface of the frame. The walls are supported on a base board (11), received by an angled section base frame (17-20), and held together by over-centre toggle catches (50). The enclosure may further comprise a lid (16) and be arranged to receive a liquid-containing bag with a closure fitting received in an aperture in one of the walls of the enclosure. Projections (31) prevent outward movement of walls (14,15). In another embodiment, a metal frame and base-board are adapted to lie on a conventional wooden pallet.

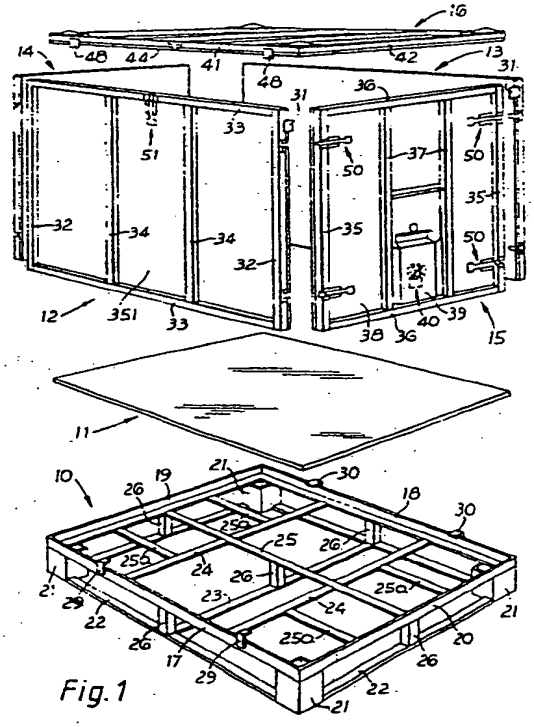

Fig. 1

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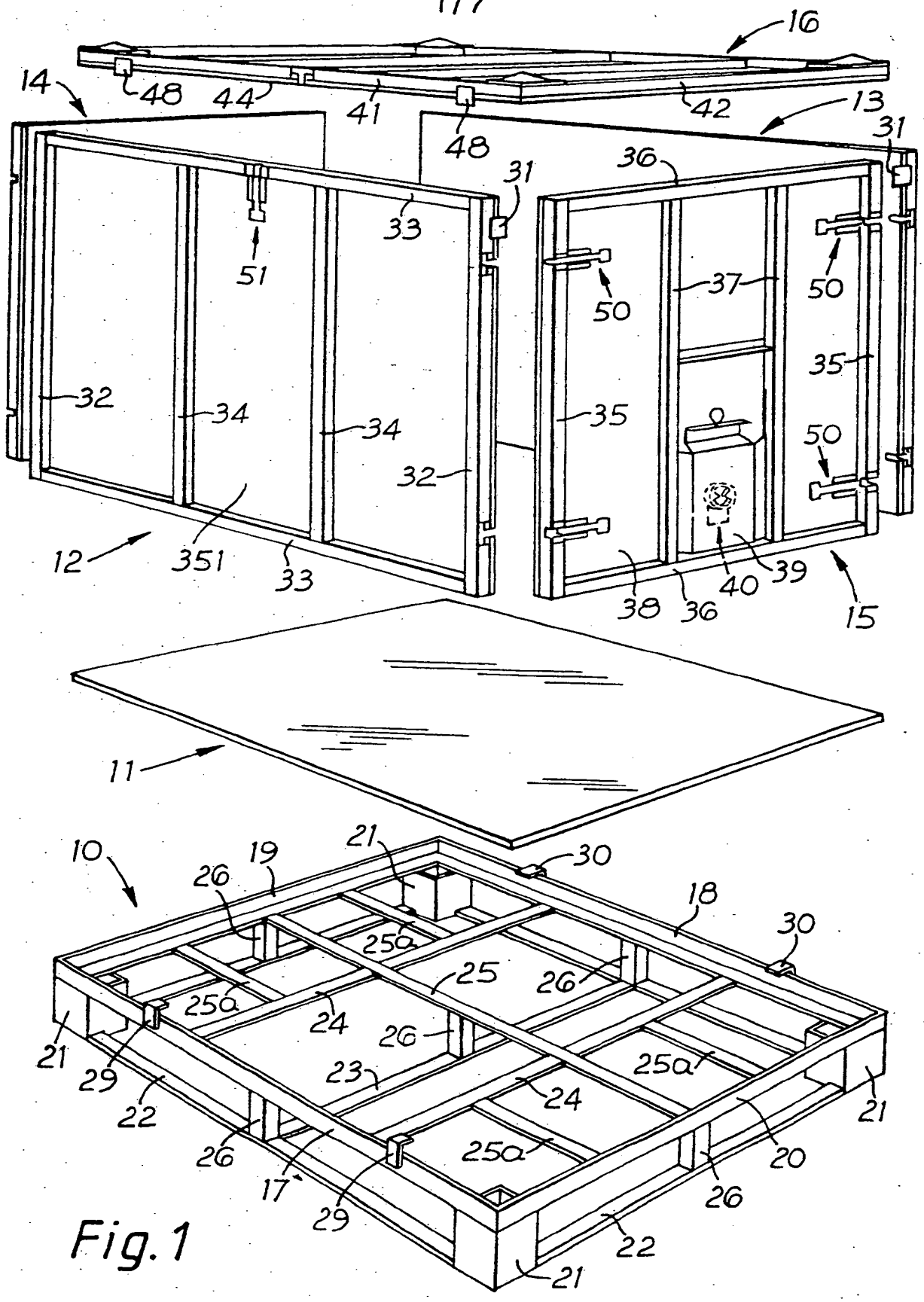

Fig. 1

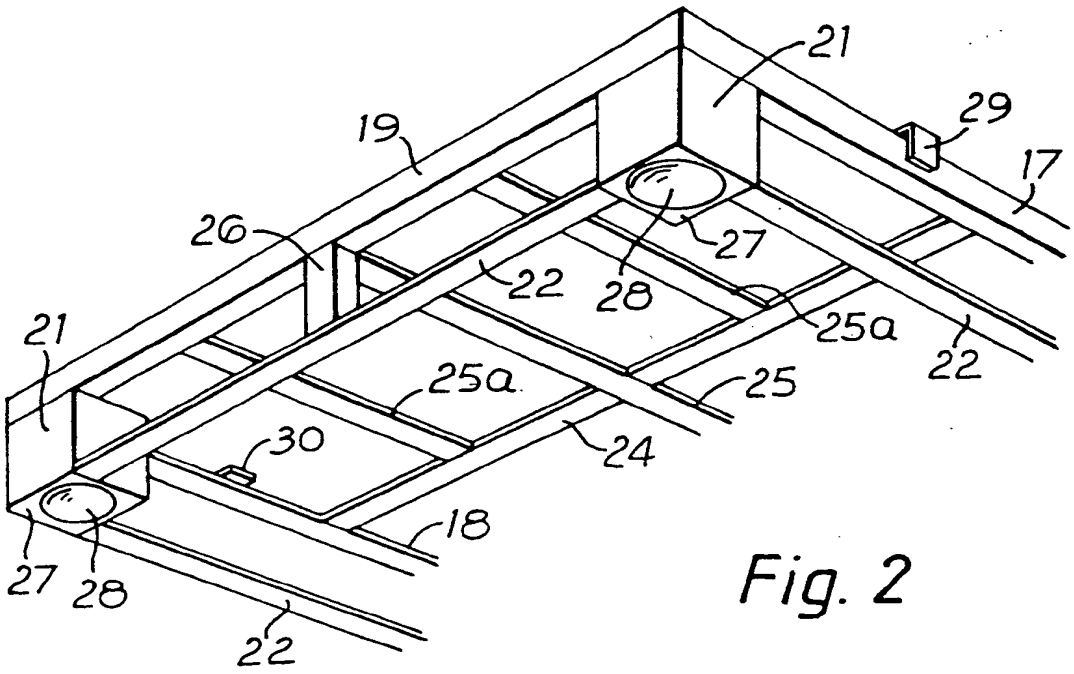

Fig. 2

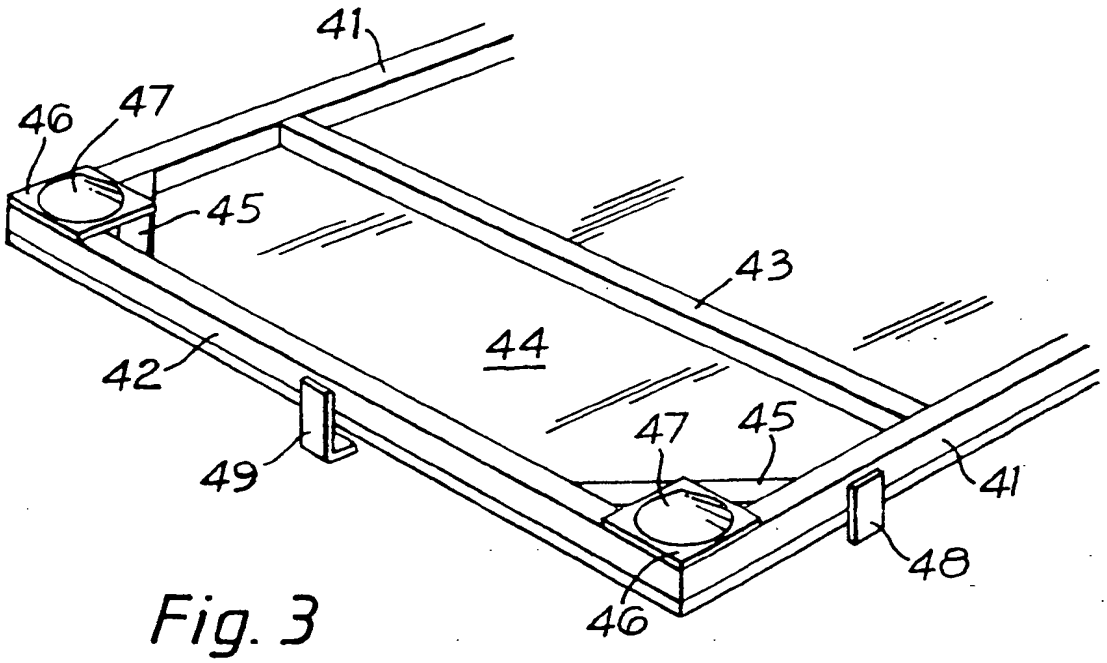

Fig. 3

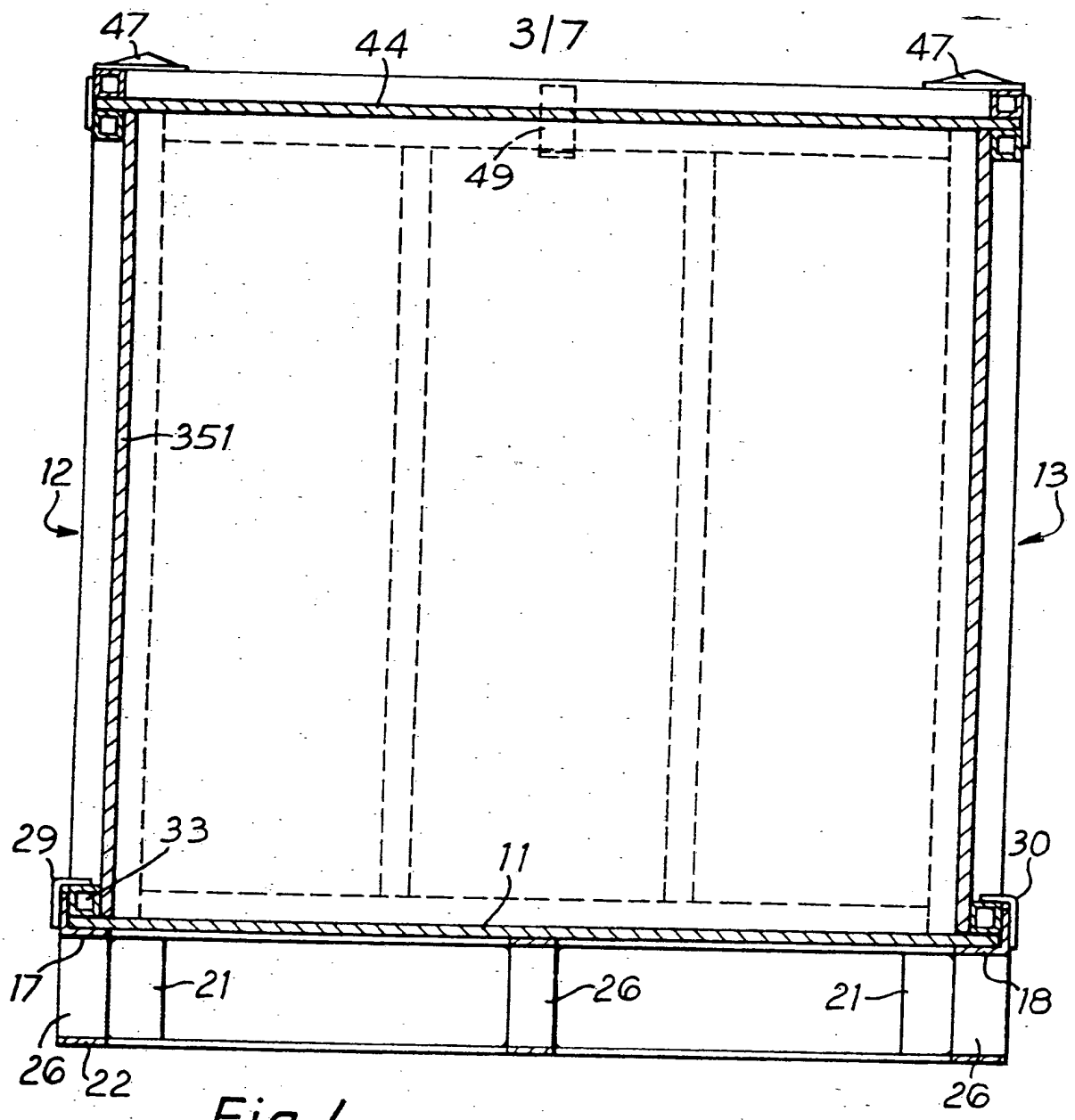

Fig. 4

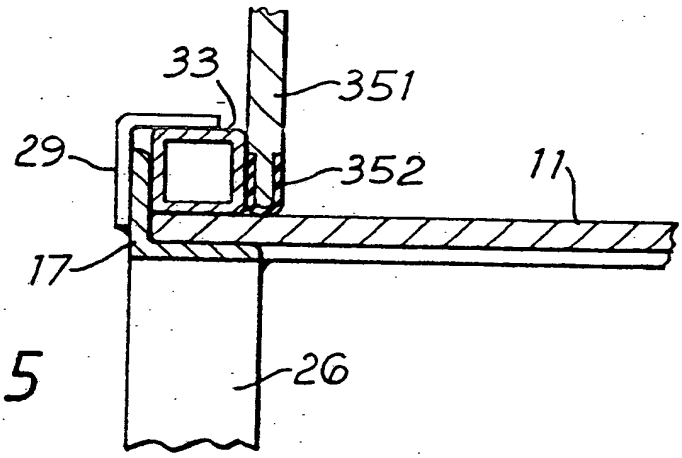

Fig. 5

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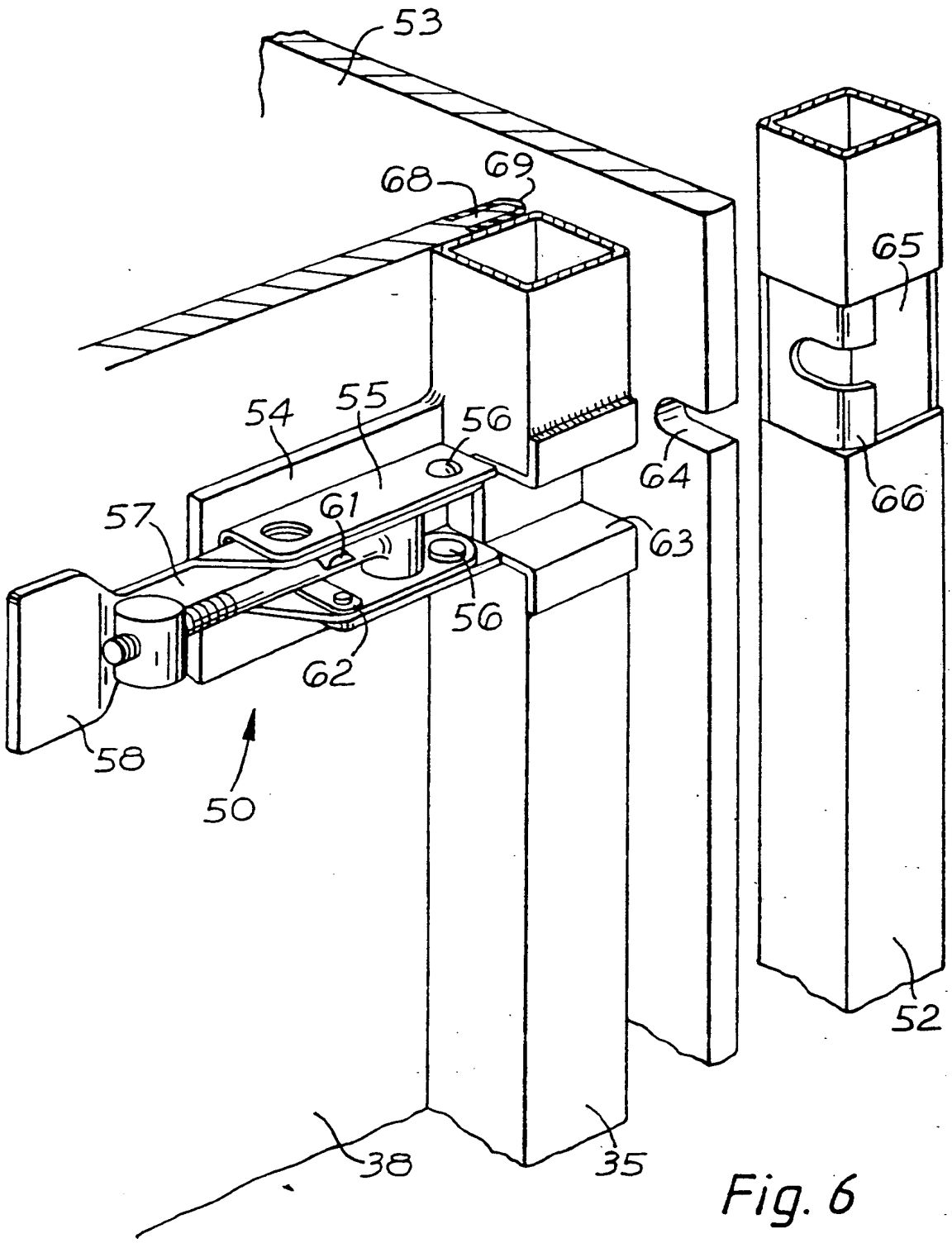

Fig. 6

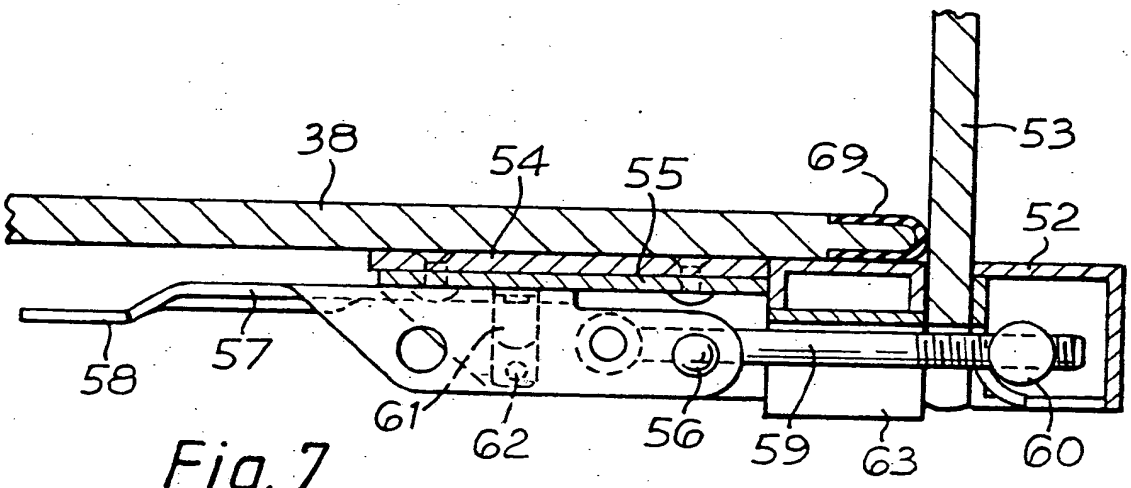

Fig. 7

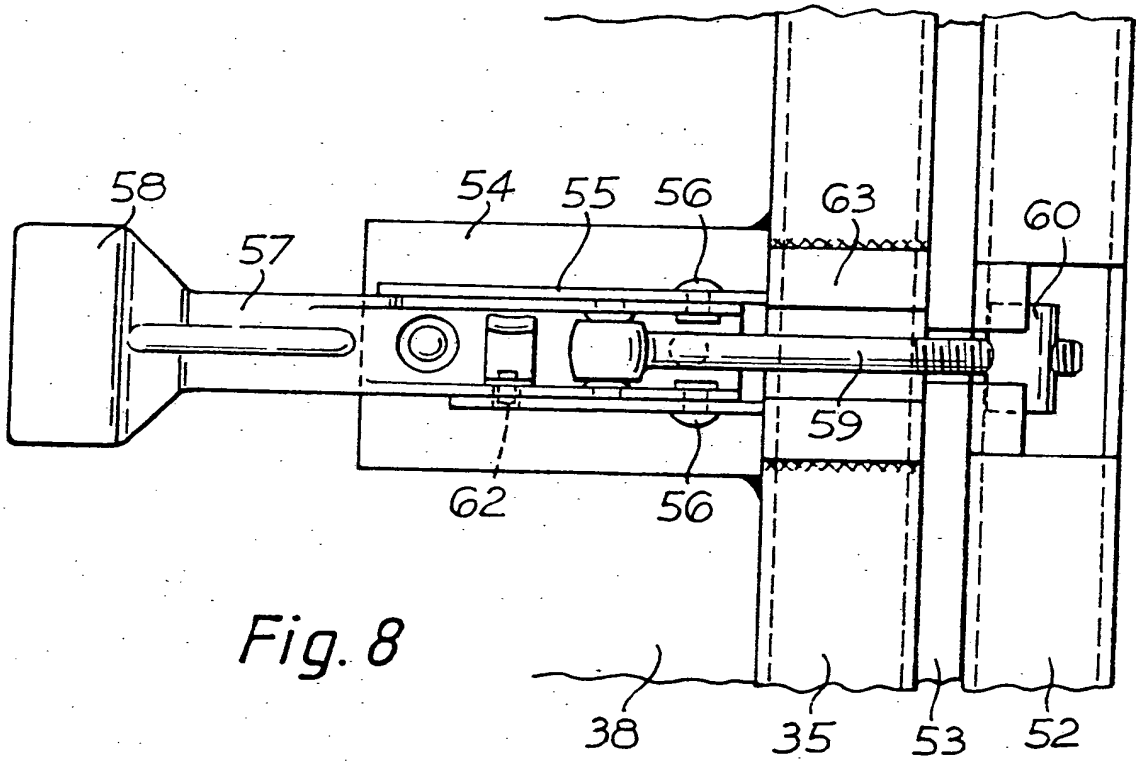

Fig. 8

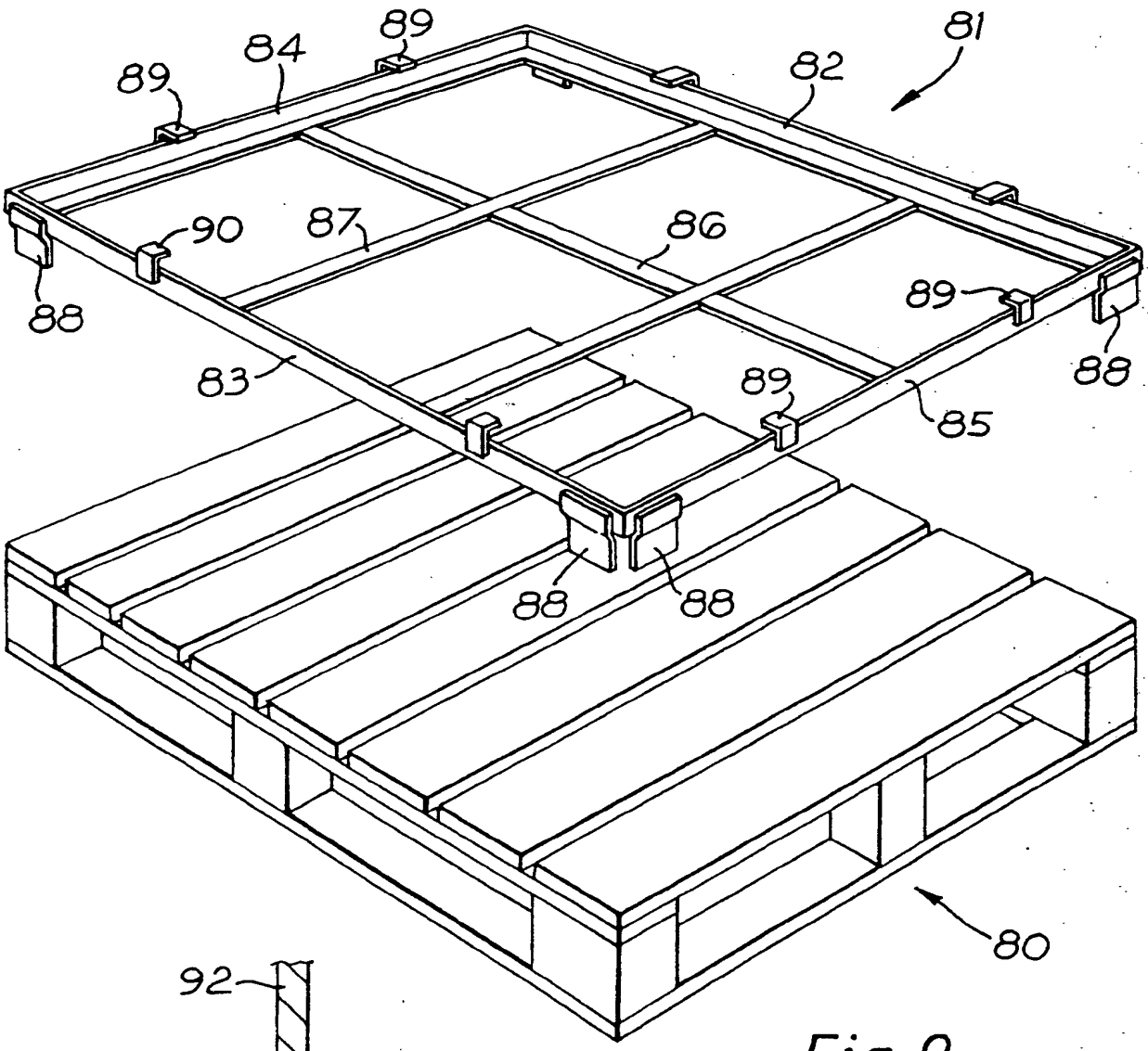

Fig. 9

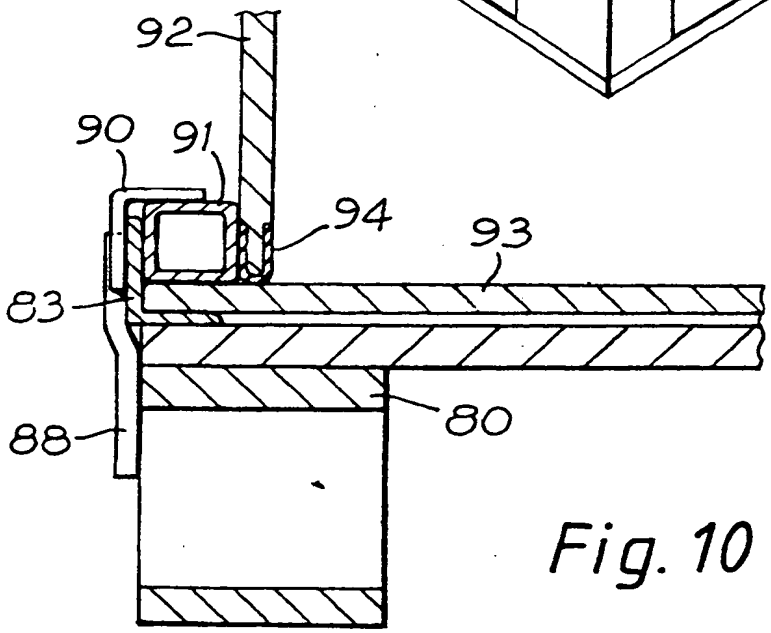

Fig. 10

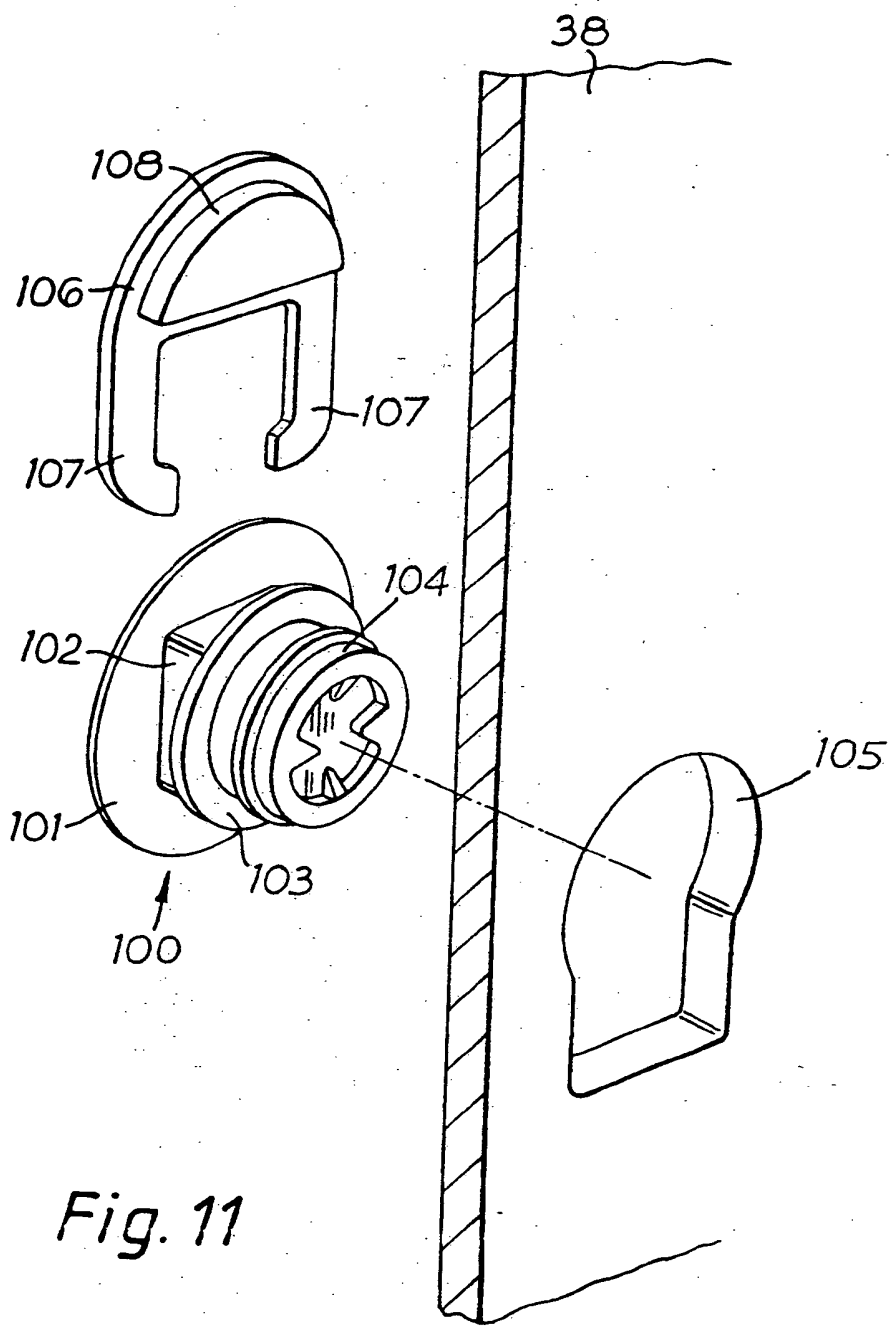

Fig. 11

COLLAPSIBLE ENCLOSURE

This invention relates to a collapsible enclosure which is adapted to be handled and carried in the same way as a pallet loaded with goods. Particularly the enclosure is adapted to be carried by a pallet, by including a base frame which either forms part of the structure of a pallet or else is adapted to fit on the top of a conventional pallet. The enclosure has been designed particularly to receive a flexible bag for containing a liquid, but may also be used without such a bag and to hold other materials.

Many proposals have been made for pallet enclosures or cages. Many of such proposals have been complicated, with complex hinge arrangements and catches by which the walls of the enclosure are held together. The object of the invention is to provide a simple collapsible enclosure to be carried by a pallet, in which the four walls of the enclosure are formed by separate panels which may be releasably connected together without hinges.

According to one aspect of the invention, we provide a collapsible enclosure of rectilinear shape and adapted to be carried by a pallet, the enclosure comprising two side wall members and two end wall members, each wall member comprising a frame and a rigid panel secured to the in-situ inside surface of the frame, and over-centre toggle catches for releasably connecting the wall members together so that when the enclosure is assembled the wall members abut at the corners of the enclosure with each end wall member being held between the ends of the side

wall members, each catch being mounted on the frame of one wall member and releasably engaging the frame of an adjacent wall member.

According to a further aspect to the invention, we provide a collapsible enclosure of rectilinear shape that is to be carried by a pallet, the enclosure comprising a base board; a rectangular base frame of angle-section within which the base-board is received and supported so as to be surrounded by a peripheral wall formed by the base frame; two side wall members and two end wall member, each wall member comprising a frame and a rigid panel secured to the in-situ inside surface of the frame, the wall members when assembled being supported on the base board and located by and within said peripheral wall; and over-centre toggle catches for releasably securing the wall members together so that the wall members abut at the corners of the enclosure with each end wall member being held between the ends of the side wall members, each toggle catch being mounted on the frame of one wall member and arranged releasably to engage the frame of an adjacent wall member; and cleats on the base frame for engaging frame elements of the side wall members to hold the latter in engagement with the base board.

By the use of toggle catches, which conveniently are mounted on the frames of the end walls and engage the frames of the side walls, an enclosure is provided which is readily and simply assembled and dismantled, without the complexities attending previously proposed pallet enclosures.

A further advantage of the use of the toggle catches to secure the walls together is that they can be tightly

secured together so that when the container is used to hold a liquid-containing bag it is constrained within the enclosure and cannot extrude through any gaps which could exist at the corners of the enclosure if the walls were not so tightly held together. The panels of the end wall members may have their vertically extending edges provided with sealing members which engage the panels of the side wall members.

To provide the necessary engagement with the base board, the panels of both the side wall members and the end wall members preferably have their lower edges provided with sealing member. Such sealing members, as for those on the vertically extending edges of the end wall members, may comprise U-section members of resilient material e.g. a suitable plastics, fitting on the relevant edge portions of the panels.

The enclosure may further comprise a lid which comprises a frame with a rigid panel secured thereto, the lid being held in position by over-centre toggle catches which act between the in-situ upper frame members of the side wall members and the frame of the lid. An end frame member of the lid may have an angled cleat which engages an upper frame member of one end wall member of the enclosure.

When such a lid is in position, secured to the side wall members by the toggle catches, it presses down on the end wall members to ensure that the latter firmly engage the base board.

These and other features of the invention will now be described by way of example with reference to the accompanying drawings, of which:

Figure 1 is an exploded perspective view of an embodiment of enclosure according to the invention;

Figure 2 is a perspective view from below of part of the base frame and pallet structure of the enclosure of Figure 1;

Figure 3 is a perspective view from above of part of the lid member of the enclosure;

Figure 4 is a transverse section through the enclosure;

Figure 5 is an enlargement of part of Figure 4;

Figure 6 is an exploded perspective view of one of the toggle catches of the enclosure;

Figures 7 and 8 are respectively a part-section and an elevation of the toggle catch;

Figure 9 is an exploded perspective view of part of a further embodiment of enclosure according to the invention, and a pallet;

Figure 10 is a section through part of the embodiment shown in Figure 9.

Referring firstly to Figure 1 of the drawings, the collapsible enclosure there illustrated comprises the main components of a base frame structure 10, a base board 11, two side wall members 12, 13, two end wall members 14, 15, and a lid member 16. The enclosure when assembled is of rectilinear shape, and as viewed in plan the side walls 12, 13 are longer than the end walls 14,

15. By way of example, the dimensions of the container as viewed in plan may be those of a standard pallet, with the side walls 1200mm in length and the end walls 1000mm in length. When we refer to "side" and "end" wall members, this terminology is used for convenience in view of the dimensions of the particular embodiment of enclosure described, but is not intended to imply that the walls fitting together in the manner hereafter described should have any particular dimensional relationship.

The base frame structure 10 serves the dual purposes of providing a base frame, to which the base board and wall members of the enclosure can be assembled, and forming a pallet which enables the enclosure to be handled in the same way as that in which conventional wooden pallets having loads thereon can be handled. Thus the base frame structure comprises a base frame made of two side lengths 17, 18 and two end lengths 19, 20 of angle section metal, e.g. steel, welded together into a rectangular frame. At the corners of such frame, short lengths of square section tube 21 extend downwardly and the lower ends of these are joined by side and end metal strips 22. The strips 22 are joined by a central transversely extending strip 23. Two transversely extending strips 24 extend between the side angle section frame members 17, 18, while a full-length longitudinal strip 25 extends between the end frame members 19, 20. Short longitudinal strips 25a are connected between the end frame members 19, 20 and the transverse strips 24. The baseboard is thus supported to be able to withstand the weight of a load to be carried by the enclosure. The whole base frame structure is completed by short vertically extending square tube members 26, which brace and reinforce the structure so that it can withstand

handling without suffering any damage.

To facilitate stacking as described hereafter, each of the square section tubes 21 at the corners of the base frame structure is provided at its underside with a closure plate 27 having a conical recess 28. For attachment of the side wall members 12, 13, as described hereafter, the angle section side member 17 of the base frame has two spaced angle-section cleats 29 welded thereto, and the angle-section side member 18 is similarly provided with two cleats 30 which face the cleats 29.

The base board 11 is a sheet of material such as plywood, of sufficient thickness to withstand the weight of material to be carried in the enclosure. Its dimensions are such that it can fit within the rectangular base frame of angle section members 17, 18, 19, 20. The transverse strip 25 supports the centre of the base board. The base board 11 carries a surface coating, e.g. of a glass-reinforced plastics material, impervious to materials likely to be carried in the enclosure and able to be cleaned when required.

The wall members 12, 13, 14, 15 are all of the same general construction as one another, with detail differences. Thus the side wall member 12 comprises a rectangular peripheral frame of vertical members 32 and horizontal members 33, and two additional reinforcing vertical members 34 spaced between the end vertical members 32. All these members are of square section tube, welded together. To the side of the frame of the side wall member which is inside the enclosure in use, there is secured, by suitable fasteners, a rigid panel 351 which, like the base board 11, may be of plywood with

a suitable surface covering. The members 32 of the side wall member are provided with lugs 31 arranged to overlap the end wall members near the top thereof, to prevent outward movement of the latter.

The side wall member 13 is identical to the side wall member 12. The end wall member 15 is also of the same construction but different dimensions, comprising a peripheral frame with vertical members 35 and horizontal members 36, additional reinforcing vertical members 37, and a rigid panel 38. The lower parts of the additional vertical members 37 are formed with slideways for a vertically sliding shutter 39 covering an opening and fitting 40 in the panel 38, which will hereafter be described in greater detail with reference to Figure 11. The end wall member 14 is the same as the end wall member 15, but without the shutter and fitting 39, 40.

The lid member 16 is once again of the same general construction as the side and end wall members of the enclosure. As seen more clearly in Figure 3, it has a peripheral frame with side members 41, end members of which one is shown in Figure 3 at 42, and transverse bracing members of which one is shown at 43, all these members being of square section tube and welded together. To the surface of these members which is inside the enclosure in use, there is secured a panel 44. At each corner of the lid member, the side and end members 41, 42 of the frame are joined by respective short inclined bracing members 45, and on the upper surface of the frame there is welded a stacking plate 46 with a conical formation 47 engagable in the conical recess 28 provided beneath each corner of the base frame structure 10. Thus, assembled enclosures can be stacked upon one another. The side members 41 of the frame of the lid are

provided with relatively short downwardly depending guide members 48. One end member 42 of the frame of the lid member may be provided with a downwardly depending angled cleat 49.

The panels of the wall members and lid member are held to the frames thereof by self tapping screws or other suitable fasteners, having countersunk heads so as not to prevent a risk of damaging a liquid-containing bag in the enclosure.

The enclosure is held together in the assembled condition by overcentre toggle catches. The end wall member 15 is provided with four such catches 50, engagable with the side wall members 12, 13. Each side wall member is provided with a single toggle catch 51, engagable with the lid member 16. The construction and operation of the toggle catches will now be particularly described with reference to Figures 6 to 8 of the drawings.

The toggle catch shown in Figures 6 to 8 is one of those provided on the end wall member 15, engagable with the side wall member 13. In these figures there is visible the vertical frame member 35 and the panel 38 of the end wall member, and a vertical frame member 52 and the panel 53 of the side wall member 13. The toggle catch is secured to a plate 54 welded to the frame member 35, and comprises a generally U-section body 55 to which is pivoted, by rivets 56, an operating member 57 with a handle portion 58. To the operating member 57, at a position spaced from the rivets 56, is pivoted a catch member in the form of a rod 59 with a screw-threaded end portion on which is received a trunnion or toggle 60. The operating member 57 carries a spring retainer 61

engagable with the rod 59 to hold it back to the operating member 57 in an inoperative position as shown in Figure 6. There is also a spring detent 62 which is engagable with the body 55 of the toggle catch to assist in holding the operating member in the illustrated position, although it will be noted that the respective pivots of the catch member and operating member are so positioned that the catch is over centre and therefore will not tend to open.

The frame member 35 is provided, in alignment with the toggle catch, with a milled-out recess in which it received a top-hat section insert 63. The panel 53 of the side wall member has an aligned recess 64. The frame member 52 of the side wall member is milled out to provide an opening 65, wherein is welded a sheet metal insert 66 providing a catch formation.

The manner of operation of the toggle catch 50 will be apparent from the drawings. When the enclosure is dismantled and not in use, the spring 61 and the detent 62 hold the operating member 57 and rod 59 in the positions shown in Figure 6, so that they do not move around loosely to cause a hazard or become damaged. When the enclosure is to be assembled, the operating member and rod are pivoted from their rest position, so that the trunnion 60 can enter the opening 65 and engage behind the catch formation insert 66. Returning the operating member to the position shown in Figures 7 and 8 will then draw the frame member 52 towards the frame member 35, so that the edge of the panel 53 is clamped between such frame members. The operating member goes over centre to retain such position, and the detent 62 assists in preventing unintentional release of the toggle catch. Possible variations in thickness of the panel 53 are

accommodated by adjustment of the trunnion 60 along the threaded portion of rod 59.

Also visible in Figures 6 and 7 is an important feature which is provided along the bottom horizontal edges of the panels for all the wall members and the vertical edges of the panels of the end wall members of the enclosure. The edge of panel 38 has a portion 68 of slightly reduced thickness on which is provided a generally U-shaped plastics sealing member 69. This is dimensioned such that, as shown in the section of Figure 7, operation of the toggle catch causes the sealing member 69 of the panel 38 to be drawn into tight engagement with the panel 53. Thus a joint is provided between the side and end wall members which is effective against any escape of material from the inside of the enclosure. This is important when the enclosure is to contain a flexible bag containing a liquid, as described hereafter.

In the complete and assembled enclosure, the toggle catches 50 provided on the end wall members thereof hold the side wall members to the end wall members. The toggle catches 51 provided on the side wall members, which engage with the lid member in the same manner as above described from the toggle catches 50, hold the lid member to the wall members. The side wall members are held to the base frame structure 10 by the cleats 29, 30.

When the enclosure is to be assembled from its component parts, the base board 11 will firstly be laid in the rectangular base frame of angle section members 17, 18, 19, 20. The two side wall members 12, 13 will then be placed vertically upon the base board, spaced slightly inwardly from the angle section members 17, 18

so as to be clear of the cleats 29, 30. The two side wall members will then be moved away from one another so that the lower horizontal frame member 33 of the side wall member 12 engages under the cleats 29, and the corresponding frame member on the opposite side wall member 13 engages under the cleats 30. Such engagement is clearly shown in Figure 4. As seen in the enlargement of Figure 5, the sealing member (352) extending along the bottom edge of the panel 351 of the side wall member 12 engages the base board 11.

The end wall members are then able to be positioned between the side wall members, and their t oggle catches engaged with the side wall members to form a rigid assembly of the wall members, base board, and base frame. It will be noted that, since the end angle section members 19, 20 of the base frame are not provided with cleats, the end wall members can simply be slid vertically downwardly into their required positions. Before the toggle catches are thus engaged the lugs 31 prevent the end wall members from moving outwardly; in the complete enclosure the lugs ensure the toggle catches are not subject to undesirable stress.

Assembly of the enclosure is completed by fitting the lid member 16 thereto. The guide members 48 on the lid member engage with the uppermost horizontal frame members of the wall members, to ensure that the lid is fitted in correct alignment. The optional provision of one cleat 49 at one end of the lid member requires that the lid be fitted by laying it on top of the assembled wall members but slightly longitudinally offset, and then sliding it horizontally the required short distance to engage the cleat 49 beneath the uppermost horizontal frame member of whichever end wall member is concerned.

If the cleat 49 is not present, the lid can simply be placed on top of the assembled wall members. Thereafter the toggle catches as 51 are engaged with the lid member to hold the latter firmly down onto the wall members, and it will be noted that when thus engaged the lid member presses downwardly on the end wall members to ensure that the latter are held firmly down onto the baseboard of the enclosure and seal thereto.

The invention thus provides a collapsible enclosure which, when assembled as above described, is rigid and, having an integral base of pallet type, can be carried and handled in the same manner as a loaded pallet.

Referring now to Figures 9 and 10, these show how the principle of the invention may be applied to an enclosure which, instead of incorporating an integral pallet base, can be carried on a conventional wooden pallet. Figure 9 shows a wooden pallet 80 and a base frame 81 for fitting thereon. The base frame comprises angle section side members 82, 83 and end members 84, 85 welded together at the corners of the frame, and reinforced by a longitudinal strip 86 and transverse strips 87. The base frame is provided adjacent its corners with downwardly extending guide members 88, which fit over the edges of the pallet so that the base frame when resting on the pallet is positively located thereon. The base frame is arranged to receive a base board and side and end wall members in the same way as the embodiment of Figures 1 to 8, except that in the embodiment of Figure 9 the members 84, 85 of the base frame are additionally provided with cleats 89. This requires that the end wall members are fitted by positioning them on the base board between the side wall members but spaced inwardly from the members 84, 85, and

then moving the end wall members away from one another to engage their frames beneath the cleats.

In the section of Figure 10, there is shown frame member 83, guide member 88 depending therefrom and engaging the pallet 80, and a cleat 90 beneath which is engaged a frame member 91 of a side wall member of the enclosure whose panel is partly shown at 92. Base board 93 fits within the base frame between the cleat 90 and the horizontally oriented part of the frame member 83. Sealing member 94 at the lowermost edge of panel 92 is shown engaging the base board 93.

An enclosure according to the invention is particularly advantageously used for carrying a flexible bag of plastics material for containing a liquid. Such a flexible bag has to be provided with a closure fitting through which it can be filled and emptied, and an arrangement thereof is shown in Figure 11. This comprises a member 100 which is a moulding of a suitable plastics material, comprising a flange 101 for securement by welding to the flexible bag. From the flange 101, there extends a neck 102 whose external surface is approximately square in cross-section followed by a further flange 103 and a spigot 104 receiving a screw-in closure member. The spigot may be adapted to be connected to a hose or other device for discharge of the liquid.

The panel 38 of the end wall member of the enclosure is provided with a keyhole-shaped aperture 105 of dimensions such that the flange 103 can pass through the part-circular portion of the aperture, after which the member 100 can be moved downwardly so that the square section neck 102 thereof lies in the rectangular portion of the aperture 105. To retain the member 100 in this

position, a retention member 106 is used. This is a moulding pf plastics material and, in the orientation in which it is used and as shown in Figure 11, is of inverted U-shape, comprising a body and two downwardly depending limbs 107 which define between them a generally square area of the same dimensions as the square exterior shape of the neck 102. A segmental projection 108 extends forwardly from the body of the member above the limbs 107. In use, after the member 100 has been placed in the aperture 105 as above described, the retention member 106 can be fitted, at the inside of the enclosure, by moving it downwardly so that its limbs 107 lie at opposite sides of the neck 102, between the flange 101 and the interior surface of the panel 38. The segmental projection 108 enters the part-circular portion of the keyhole aperture 105, above the neck 102. Such fitting is possible by virtue of the flexibility of the plastics material from which the retention member 106 is made. When thus fitted, the member 100 is securely held in the lower part of the aperture 105. The sliding shutter 39 covers these parts, to protect from possible damage.

When the enclosure is used to carry a liquid-containing flexible bag, the effective seal provided between the wall members, base board, and lid member of the enclosure by virtue of the above described method of securing these members together, and the provision of sealing members along the edges of the panels thereof, is effective against the possibility of there being any small gaps through which the liquid containing bag could extrude to suffer damage and consequently leak.

In order to render the enclosure usable to contain different types of flexible bag, in particular ones with different types and/or sizes of closure fitting, the

panel of the end wall member 15 may include a replaceable portion having the keyhole aperture 105. If a different type of bag is to be used, the portion of the panel having the keyhole aperture may be replaced by one provided with a different size or shape of aperture.

CLAIMS

1. A collapsible enclosure of rectilinear shape and adapted to be carried by a pallet, the enclosure comprising two side wall members and two end wall members, each wall member comprising a frame and a rigid panel secured to the in-situ inside surface of the frame, and over-centre toggle catches for releasably connecting the wall members together so that when the enclosure is assembled the wall members abut at the corners of the enclosure with each end wall member being held between the ends of the side wall members, each catch being mounted on the frame of one wall member and releasably engaging the frame of an adjacent wall member.

2. A collapsible enclosure of rectilinear shape adapted to be carried by a pallet, the enclosure comprising a base board; a rectangular base frame of angle-section within which the base board is received and supported so as to be surrounded by a peripheral wall formed by the base frame; two side wall members and two end wall members, each wall member comprising a frame and a rigid panel secured to the in-situ inside surface of the frame, the wall members when assembled being supported on the base board and located by and within said peripheral wall; and over-centre toggle catches for releasably securing the wall members together so that the wall members abut at the corners of the enclosure with each end wall member being held between the ends of the side wall members, each toggle catch being mounted on the frame of one wall member and arranged releasably to engage the frame of an adjacent wall member; and cleats on the base frame for engaging frame elements of the side wall members to hold the latter in engagement with the base board.

3. An enclosure according to Claim 1 or Claim 2 wherein the side wall members have projections which overlap the frames of the end wall members at positions remote from the base frame to restrain outward movement of the end wall members.

4. An enclosure according to any one of the preceding claims wherein the toggle of each catch is received in a recess in the frame member of said adjacent wall member and engages abutments adjacent to the recess.

5. An enclosure according to any one of the preceding claims wherein, when the enclosure is assembled, the end wall members and side wall members abut along substantially planar surfaces.

6. An enclosure according to any one of the preceding claims including a lid which comprises a frame with a rigid panel secured thereto, and wherein the lid is held in position by over-centre toggle catches acting between in-situ upper frame members of the side wall member and the lid frame.

7. An enclosure according to Claim 6 wherein the sides of the lid have guides which engage the frames of opposite walls of the enclosure.

8. An enclosure according to Claim 6 or Claim 7 wherein an end frame member of the lid has an angled cleat engaging an in-situ upper frame member of an end wall member of the enclosure.

9. An enclosure according to any one of the preceding claims wherein the panels of the end wall members have their vertically extending edges provided with sealing members which have sealing engagement with the panels of the side wall members.

10. An enclosure according to any one of the preceding claims wherein the panels of the wall members have their lower edges provided with sealing members which have sealing engagement with the base board.

11. An enclosure according to Claim 9 or Claim 10 wherein the sealing members comprise U-section members of resilient material, fitting on the relevant edge portions of the panels.

12. An enclosure according to any one of the preceding claims adapted to carry a flexible bag for containing a liquid, and wherein the panel of one of the wall members has an aperture for receiving a closure fitting for the bag.

13. An enclosure according to Claim 12 wherein said aperture is of keyhole shape, comprising a portion through which said closure fitting can be passed, and a portion wherein said closure fitting can be held.

14. The combination of an enclosure according to Claim 13 and said flexible bag; the bag having its closure fitting occupying the said portion of said aperture.

15. The combination according to claim 14 further comprising a retaining member occupying the first said portion of said aperture.

16. An enclosure according to Claim 12 or Claim 13 or the combination of Claim 14 or Claim 15 further comprising a shutter movable to cover paid aperture and closure fitting.

17. An enclosure according to any one of the preceding claims wherein said base frame forms part of a pallet.

18. An enclosure according to any one of Claims 1 to 16 wherein said base frame is adapted to fit on top of a pallet, and has locating formations engagable with the pallet.

19. The combination of an enclosure as claimed in Claim 18 and a pallet.

20. An enclosure substantially as hereinbefore described with reference to the accompanying drawings.

21. A combination of an enclosure and a pallet substantially as hereinbefore described with reference to the accompanying drawings.

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